

## A-1 Urban Water Conservation Grant Application Cover Sheet

1. Applicant (Organization or affiliation): The City of San Mateo
2. Project Title: Irrigation Conservation
3. Person authorized to sign and submit proposal:
- |                        |   |
|------------------------|---|
| <b>Name, Title</b>     | <u>Sheila Canzian: Director of Parks &amp; Recreation</u><br><u>For The City of San Mateo</u> |
| <b>Mailing address</b> | <u>330 West 20<sup>th</sup> Avenue</u><br><u>San Mateo, CA 94403</u>                          |
| <b>Telephone</b>       | <u>650-522-7404</u>   |
| <b>Fax</b>             | <u>650-522-7401</u>   |
| <b>E-mail</b>          | <u>scanzian@cityofsanmateo.org</u>  |
4. Contact person:
- |                        |   |
|------------------------|---|
| <b>Name, Title</b>     | <u>Bruce Reed: Parks &amp; Landscape Coordinator</u>                          |
| <b>Mailing address</b> | <u>2001 Pacific Blvd.</u><br><u>San Mateo, CA 94403</u>                       |
| <b>Telephone</b>       | <u>650-522-7424</u>   |
| <b>Fax</b>             | <u>650-522-7421</u>   |
| <b>E-Mail</b>          | <u><a href="mailto:breed@cityofsanmateo.org">breed@cityofsanmateo.org</a></u> |
5. Funds requested (dollar amount): \$155,252
6. Applicant funds pledged (local cost share) \$ -0-
7. Total project costs (dollar amount): \$155,252
8. Estimated net water savings (acre-feet/year): 19
- Estimated total amount of water to be saved (acre-feet):
- Over 20 years 380
- Benefit/cost ratio of project for applicant:
- Estimated \$/acre-feet of water to be saved: 1.1
9. Project life (month/year to month/year): 11/02-02/04
10. State Assembly District where the project is to be conducted: 19
11. State Senate District where the project is to be conducted: 8
12. Congressional District(s) where the project is to be conducted: 12
13. County where the project is to be conducted: San Mateo
14. Do the actions in this application involve physical changes in land use, or potential future changes in land use?
- (a) Yes
- (b) No XXX

## A-2 Application Signature Page

By signing below, the official declares the following:

The truthfulness of all representations in the application;

The individual signing the form is authorized to submit the application on behalf of the applicant;

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the application on behalf of the applicant; and

The applicant will comply with all terms and conditions identified in this Application Package if selected for funding.

Sheila Canzian  
Director of parks & Recreation  
City of San Mateo, CA

<u>Signature</u>	<u>Name and title</u>	<u>Date</u>
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### **A-3 Application Checklist**

Complete this checklist to confirm all sections of this application package have been completed.

#### **Part A: Project Description, Organizational, Financial and Legal Information**

- ☒ A-1 Urban Water Conservation Grant Application Cover Sheet
- ☒ A-2 Application Signature Page
- ☒ A-3 Application Checklist
- ☒ A-4 Description of project
- ☐ N/A A-5 Maps
- ☒ A-6 Statement of work, schedule
- ☒ A-7 Monitoring and Evaluation
- ☒ A-8 Qualifications of the Applicant and Cooperators
- ☒ A-9 Innovation
- ☒ A-10 Agency Authority
- ☐ N/A A-11 Operations and Maintenance

#### **Part B: Engineering and Hydrologic Feasibility (construction projects only)**

- ☐ N/A B-1 Certification statement
- ☐ N/A B-2 Project reports and previous studies
- ☐ N/A B-3 Preliminary project plans and specifications
- ☐ N/A B-4 Construction inspection plan

#### **Part C: Plan for Environmental Documentation and Permitting**

- ☐ N/A C-1 CEQA/NEPA
- ☐ N/A C-2 Permits, easements, licenses, acquisitions, and certifications
- ☐ N/A C-3 Local land use plans
- ☐ N/A C-4 State and local statutes and regulations

#### **Part D: Need for Project and Community Involvement**

- ☒ D-1 Need for project
- ☒ D-2 Community involvement, support, opposition

#### **Part E: Water Use Efficiency Improvements and Other Benefits**

- ☒ E-1 Water use efficiency improvements
- ☒ E-2 Other project benefits

#### **Part F: Economic Justification, Benefits to Costs Analysis**

- ☒ F-1 Net water savings
- ☒ F-2 Project budget and budget justification
- ☒ F-3 Economic efficiency
- ☒ Benefit/Cost Analysis Tables 1; 2; 3; 4a, 4b, 4c, 4d; and 5

**Table 1: Capital Costs**

	Capital Cost Category (a)	Cost (b)	Contingency Percent (c)	Contingency \$ (d)	Subtotal (e)
				(bxc)	(b+d)
(a)	Land Purchase/Easement	\$0	N/A	N/A	\$0
(b)	Planning/Design/Engineering	\$0	N/A	N/A	\$0
(c)	Materials/Installation	\$41,950	N/A	N/A	\$41,950
(d)	Structures	\$0	N/A	N/A	\$0
(e)	Equipment Purchases/Rentals	\$91,665	N/A	N/A	\$91,665
(f)	Environmental Mitigation/Enhancement	\$0	NA	N/A	\$0
(g)	Construction/Administration/Overhead	\$14,075	N/A	N/A	\$14,075
(h)	Project Legal/License Fees	\$0	N/A	N/A	\$0
(i)	Other (sales tax)	\$7,562	N/A	N/A	\$7,562
(j)	Total (1) (a + ... + i)	\$155,252	N/A	N/A	\$155,252
(k)	Capital Recovery Factor: use Table 6	0.0872	N/A	N/A	N/A
(l)	Annual Capital Costs (j x k)	\$13,538	N/A	N/A	\$13,538

(1) Costs must match Project Budget prepared in Section F-2.

**Table 2: Annual Operations and Maintenance Costs**

Administration (a)	Operations (b)	Maintenance (c)	Other (d)	Total (e)
	\$400		\$720 (phone)	\$1,120

**Table 3: Total Annual Costs**

Annual Capital Costs (1) (a)	Annual O&M Costs (2) (b)	Total Annual Costs (c) (a+b)
\$13,538	\$1,120	\$14,658

(1) From Table 1 line (l)

(2) From Table 2 Total, column (e)

## Table 4: Water Supply Benefits

Annual amount of water to be saved (acre-feet) 19

### 4a. Avoided Costs of Current Supply Sources

Sources of Supply (a)	Cost of Water (\$/AF) (b)	Annual Displaced Supply (AF) (c)	Annual Avoided Costs (\$) (d) (b x c)
Cal-Water	\$850	19	\$16,150
<b>Total</b>	<b>\$850</b>	<b>19</b>	<b>\$16,150</b>

### 4b. Alternative Costs of Future Supply Sources

Future Supply Sources (a)	Total Capital Costs (\$) (b)	Capital Recovery Factor (1) (c)	Annual Capital Costs (\$) (d) (b x c)	Annual O&M Costs (\$) (e)	Total Annual Avoided Costs (\$) (f) (d + e)
N/A					
<b>Total</b>					

(1) 6% discount rate; Use Table 6- Capital Recovery Factor

**4c. Water Supplier Revenue (Vendibility)**

Parties Purchasing Project Supplies  (a)	Amount of Water to be Sold  (b)	Selling Price (\$/AF)  (c)	Expected Frequency of Sales (%) (1)  (d)	Expected Selling Price (\$/AF)  (e) (c x d)	"Option" Fee (\$/AF) (2)  (f)	Total Selling Price (\$/AF)  (g) (e + f)	Annual Expected Water Sale Revenue (\$)  (h) (b x g)
N/A							
<b>Total</b>							

- (1) During the analysis period, what percentage of years are water sales expected to occur? For example, if water will only be sold half of the years, enter 50% (0.5).
- (2) "Option" fees are paid by a contracting agency to a selling agency to maintain the right of the contracting agency to buy water whenever needed. Although the water may not be purchased every year, the fee is usually paid every year.

**4d: Total Water Supply Benefits**

(a) Annual Avoided Cost of Current Supply Sources (\$) from 4a, column (d)	\$16,150
(b) Annual Avoided Cost of Alternative Future Supply Sources (\$) from 4b, column (f)	\$ N/A
(c) Annual Expected Water Sale Revenue (\$) from 4c, column (h)	\$ N/A
(d) Total Annual Water Supply Benefits (\$) (a + b + c)	\$16,150

**Table 5: Benefit/Cost Ratio**

<b>Project Benefits (\$) (1)</b>	<b>\$16,150</b>
<b>Project Costs (\$) (2)</b>	<b>\$14,658</b>
<b>Benefit/Cost Ratio</b>	<b>1.1</b>

(1) From Tables 4d, row (d): Total Annual Water Supply Benefits

(2) From Table 3, column (c) : Total Annual Costs

**Table 6: Capital Recovery Factor**

(Use to obtain factor for Table 1, Line k or Table 4b, Column (c))

Life of Project (in years)	Capital Recovery Factor
7	0.1791
8	0.1610
9	0.1470
10	0.1359
11	0.1268
12	0.1193
13	0.1130
14	0.1076
15	0.1030
16	0.0990
17	0.0954
18	0.0924
19	0.0896
20	0.0872
21	0.0850
22	0.0830
23	0.0813
24	0.0797
25	0.0782
26	0.0769
27	0.0757
28	0.0746
29	0.0736
30	0.0726
31	0.0718
32	0.0710
33	0.0703
34	0.0696
35	0.0690
36	0.0684
37	0.0679
38	0.0674
39	0.0669
40	0.0665
41	0.0661
42	0.0657
43	0.0653
44	0.0650
45	0.0647
46	0.0644
47	0.0641
48	0.0639
49	0.0637
50	0.0634





## A-4 Description of Project

This project will continue the City of San Mateo's on-going effort to improve our irrigation system by expanding the CALSENSE Company system to new areas and retrofitting an existing area Median strips on J. Hart Clinton Drive, Saratoga Drive and Bridge Point Parkway, as well as Laurelwood and Joinville Parks are the subjects of this project. The Saratoga Drive area is a retrofit. All other areas are new installations. See attached maps for the geographic location of these sites.

The project goal is to reduce water use at the five sites by 40%, from the 47 acre feet per year currently used to up to 29 acre feet per year, a reduction comparable to that achieved in city parks that have already been fully retrofitted. The objective is to install water-conserving equipment including field satellite controllers, flow sensors, master valves, radio equipment, and communication cable.

Improvements will be accomplished with state-of-the-art equipment manufactured by CALSENSE Company and installed by a qualified contractor under the supervision of the city's professional staff and representatives of the manufacturer.

Key features of the system include:

- Automatic daily re-programming of all field satellites based on site weather conditions
- Automatic shut-down of all field satellites due to rainfall or excessive wind
- Automatic shut-down of systems with unscheduled, unwanted or excessive flow
- Irrigation programming and monitoring of all field satellites from the central computer
- Tracking and reporting of water consumption and irrigation component failures
- Access to the central computer from anywhere via computer and phone modem

The expected outcome will be a complete electronic irrigation system, which will reduce water use by 40%.

This savings can be achieved by setting the controllers to run two days a week in spring and fall, three days a week in summer, and setting the system to only use 60% of the daily ET, thus a 40% savings.

Additional savings will be achieved by reducing the amount of time it takes to physically monitor parks and median strips for irrigation deficiencies, broken sprinkler heads and major breaks as they occur.

The estimated cost of the proposed project is \$155,252. *In an effort to maximize grant funds, the project can be broken into phases.* Even partial funding will help to expedite the city's goal of fully automating their irrigation system.

The primary benefit will be a reduction in water use by up to 19 acre-feet per year. At the current \$850 per acre-foot rate of Cal-Water, the city's supplier, the dollar savings will be \$16,150 per year, which will result in payback in 10 years or less without even factoring in future rate increases. Additional benefits will be savings in staff time, transportation and equipment.

## A-5 Maps

Not Applicable

**A-6 Statement of Work, Schedule**

The methods, procedures and technical adequacy of this proposal are utilization of high tech equipment critical for water conservation. We are ready to proceed as soon as funds are awarded. Reputable firms have been contacted and are ready to proceed with the installation.

Task list and schedule, deliverable items, due dates, project costs for each task, quarterly expenditure, start and completion dates of each task.

**J. Hart Clinton Drive:** This roadway has a 1.5-mile median and is adjacent to the San Francisco Bay. The procedure involves removal of existing old technology stand-alone irrigation clocks. The excavation to main line and installation of flow meters and master valves. Install new stainless steel enclosures with transient protection and wire boards. Install new CALSENSE controllers. Wire up the master valve and flow meter to controller. Wire all existing field wires for valves to new controller and program station square footage to establish precipitation rates. The enclosure will have antenna and controllers will include local radio cards. This will be a controller A through F or **#1 - #6**. Number 7 will be the installation of a local radio hub to be located at Anchor Road and J. Hart Clinton Drive. This part of the project requires a hub and modem installed within a stainless steel enclosure, a phone line install and a stick antenna atop one of the city streetlights. Once installed the hub will be issued a phone number our central will call to coordinate irrigations. The hub will connect the central computer with one of the satellite controllers via a unique address for each satellite. Number eight, the final phase in this area, will be another controller install for the back side of Bayside Joinville Park, which will also communicate by local radio hub.

Task & Items	Due Dates	Costs	Quarter	Start/End Date
<b>J. Hart Clinton Drive</b>				
<b>#1 Clock A</b>	<b>11/03</b>		<b>4th</b>	<b>10-11/03</b>
8 Station CALSENSE Et 2000			\$ 2,785.00	
Irrigation controller with local radio				
Communication				
CALSENSE integrated radio remote		151.00		
Receiver board				
Heavy-Duty stainless-steel enclosure		2,079.00		
W/installed TP-1, TP-110 And ANT-1				
1-1/2" Flow Meter and Master Valve		477.00		
Subtotal		\$ 5,492.00		
8.25% Sales Tax		\$ 453.09		
Installation Labor		\$ 2,850.00		
Admin./Survey/Cont. (10%)		\$ 879.51		
Total		\$ 9,674.60		

Task & Items	Due Dates	Costs	Quarter	Start/End Date
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**J. Hart Clinton Drive**

<b>#2 Clock B</b>	<b>11/03</b>		<b>4th</b>	<b>10-11/03</b>
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8 STATION CALSENSE ET-2000		\$ 2,785.00		
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Irrigation controller with local radio				
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Communication				
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CALSENSE integrated radio remote		151.00		
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Receiver board				
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Heavy-Duty stainless-steel enclosure		2,079.00		
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W/installed TP-1, TP-110 And ANT-1				
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1-1/2" Flow Meter and Master Valve		477.00		
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Subtotal		\$ 5,492.00		
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8.25% Sales Tax		\$ 453.09		
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Installation Labor		\$ 2,650.00		
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Admin. /Survey/Cont. (10%)		\$ 859.51		
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Total		\$ 9,454.60		
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Task & Items	Due Dates	Costs	Quarter	Start/End Date
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**J. Hart Clinton Drive**

<b>#3 Clock C</b>	<b>11/03</b>		<b>4th</b>	<b>10-11/03</b>
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16 STATION CALSENSE ET-2000		\$ 3,472.00		
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Irrigation controller with local radio				
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Communication				
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CALSENSE integrated radio remote		151.00		
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Receiver board				
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Heavy-Duty stainless-steel enclosure		2,079.00		
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W/installed TP-1, TP-110 And ANT-1				
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1-1/2" Flow Meter and Master Valve		477.00		
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Subtotal		\$ 6,179.00		
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8.25% Sales Tax		\$ 509.77		
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Installation Labor		\$ 2,650.00		
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Admin./Survey/Cont. (10%)		\$ 933.65		
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Total		\$10,272.42		
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Task & Item	Due Dates	Costs	Quarter	Start/End Date
<b>J. Hart Clinton Drive</b>				
<b>#4 Clock D</b>	<b>12/03</b>		<b>4th</b>	<b>11-12/03</b>
8 STATION CALSENSE ET-2000		\$ 2,785.00		
Irrigation controller with local radio				
Communication				
CALSENSE integrated radio remote		151.00		
Receiver board				
Heavy-Duty stainless-steel enclosure		2,079.00		
W/installed TP-1, TP-110 And ANT-1				
1-1/2" Flow Meter and Master Valve		477.00		
Subtotal		\$ 5,492.00		
8.25% Sales Tax		\$ 453.09		
Installation Labor		\$ 2,650.00		
Admin./Survey/Cont. (10%)		\$ 859.51		
Total		\$ 9,454.60		

Task & Item	Due Dates	Costs	Quarter	Start/End Date
<b>J. Hart Clinton Drive</b>				
<b>#5 Clock E</b>	<b>12/03</b>		<b>4th</b>	<b>11-12/03</b>
24 STATION CALSENSE ET-2000		\$ 3,825.00		
Irrigation controller with local radio				
Communication				
CALSENSE integrated radio remote		151.00		
Receiver board				
Heavy-Duty stainless-steel enclosure		2,079.00		
W/installed TP-1, TP-110 And ANT-1				
1-1/2" Flow Meter and Master Valve		477.00		
Subtotal		\$ 6,532.00		
8.25% Sales Tax		\$ 538.89		
Installation Labor		\$ 2,650.00		
Admin. /Survey/Cont. (10%)		\$ 972.09		
Total		\$10,692.98		

<u>Task &amp; Items</u>	<u>Due Dates</u>	<u>Costs</u>	<u>Quarter</u>	<u>Start/End Date</u>
<b>J. Hart Clinton Drive</b>				
<b>#6 Clock F</b>	<b>12/03</b>		<b>4th</b>	<b>11-12/03</b>
24 STATION CALSENSE ET-2000		\$ 3,825.00		
Irrigation controller with local radio				
Communication				
CALSENSE integrated radio remote		151.00		
Receiver board				
Heavy-Duty stainless-steel enclosure		2,079.00		
W/installed TP-1, TP-110 And ANT-1				
1-1/2" Flow Meter and Master Valve		477.00		
Subtotal		\$ 6,532.00		
8.25% Sales Tax		\$ 538.89		
Installation Labor		\$ 2,650.00		
<u>Admin. /Survey/Cont. (10%)</u>		<u>\$ 972.09</u>		
Total		\$10,692.98		

**#7 Install Local Radio Hub:** Locate at Anchor Road and J. Hart Clinton Drive a stainless steel enclosure to house the radio hub and modem. Locate by phone vault for easy phone hook up. Install phone line and external antenna cabling to hub. Install stick antenna from hub to high spot on street light pole. This system communicates from the central computer to the radio hub by hard phone wire. The hub then connects to what ever satellite controller you are addressing. They will each have a unique address. This hub will be used to communicate with all the controllers on J. Hart Clinton Drive and the Anchor Road side of Bayside Joinville Park.

<u>Task &amp; Items</u>	<u>Due Dates</u>	<u>Costs</u>	<u>Quarter</u>	<u>Start/End Date</u>
<b>J. Hart Clinton Drive</b>				
<b>Radio Hub</b>	<b>12/3</b>		<b>4</b>	<b>11-12/03</b>
Local radio hub		\$ 3,016.00		
110 vac electric install		350.00		
Phone Line Install		250.00		
Local radio stick antenna		260.00		
Antenna cable with end connectors 60 ft. cable		348.00		
Stainless steel enclosure SB24SS		940.00		
Subtotal		\$ 5,164.00		
8.25% Sales Tax		\$ 426.03		
Installation Labor		\$ 2,250.00		
<u>Admin./Survey/Cont. (10%)</u>		<u>\$ 741.40</u>		
Total		\$ 8,581.43		

**# 8 Bayside/Joinville Park East:** Remove Irritrol clock, install stainless steel enclosure, install Calsense ET2000 controller and transient board. Trench from enclosure 325 feet to main line and install flow meter and master valve and connect wiring to transient board. Install all valve wiring and program Calsense for station square footage so controller can establish precipitation rates needed for ET factoring..

Task & Items	Due Dates	Costs	Quarter	Start/End Date
<b>Bayside Joinville Park E.</b>	<b>12/03</b>		<b>4th</b>	<b>11-12/03</b>
24 STATION CALSENSE ET-2000		\$ 3,825.00		
Irrigation controller local radio				
Communication				
CALSENSE integrated radio remote		151.00		
Receiver board				
Heavy-Duty stainless-steel enclosure		2,079.00		
W/installed TP-1, TP-110 And ANT-1				
1-1/2" Flow Meter and Master Valve		477.00		
Subtotal		\$ 6,532.00		
8.25% Sales Tax		\$ 538.89		
Installation Labor		\$ 3,850.00		
Admin. /Survey/Cont. (10%)		\$ 1,092.09		
Total		\$12,012.98		

**#9 Laurel wood Park Instructions:** Remove old traffic controller box and irritrol clock. Trench 500 feet from the controller to the pay phone. Excavate to main line adjacent to the pay phone and install flow meter and mastervlve. Connect wires from flow meter, master valve and phone line to new CALSENSE controller. Install new stainless steel enclosure with transient protection, proper grounding and wire board. Wire up controller and program for square footage of all irrigation zones.

Task & Items	Due Dates	Cost	Quarter	Start/End Date
	<b>12/03</b>		<b>4</b>	<b>11-12/03</b>
24 STATION CALSENSE ET-2000		\$ 2,889.00		
Irrigation controller with phone				
Communication				
CALSENSE integrated radio remote		151.00		
Receiver board				
Heavy-Duty stainless-steel enclosure		2,079.00		
W/installed TP-1, TP-110 And ANT-1				
1-1/2" Flow Meter and Master Valve		477.00		
Subtotal		\$ 5,596.00		
8.25% Sales Tax		\$ 461.67		
Installation Labor		\$ 2,650.00		
Admin. /Survey/Cont. (10%)		\$ 870.77		
Total		\$ 9,578.44		

**Bridge Point Parkway:** This median has only two controllers but irrigates ¼ mile of plantings. CALSENSE controllers will replace the existing irrigator clocks with the same installations as those on J. Hart Clinton Drive. There will also be a radio hub installed for this area.

Task & Items	Due Dates	Costs	Quarter	Start/End Date
<b>#10 Bridgepoint Parkway</b>	<b>1/04</b>		<b>1st</b>	<b>12/03-1/04</b>
8 STATION CALSENSE ET-2000 Irrigation controller with local radio Communication		\$ 2,785.00		
CALSENSE integrated radio remote Receiver board		151.00		
Heavy-Duty stainless-steel enclosure W/installed TP-1, TP-110 And ANT-1 1-1/2" Flow Meter and Master Valve		2,079.00 477.00		
Subtotal		\$ 5,492.00		
8.25% Sales Tax		\$ 453.09		
Installation Labor		\$ 1,800.00		
Admin. /Survey/Cont. (10%)		\$ 774.51		
Total		\$ 8,519.60		

Task & Items	Due Dates	Costs	Quarter	Start/End Date
<b>#11 Bridgepoint Parkway</b>	<b>1/04</b>		<b>1st</b>	<b>12/03-1/04</b>
16 STATION CALSENSE ET-2000 Irrigation controller with local radio Communication		\$ 3,472.00		
CALSENSE integrated radio remote Receiver board		151.00		
Heavy-Duty stainless-steel enclosure W/installed TP-1, TP-110 And ANT-1 1-1/2" Flow Meter and Master Valve		2,079.00 477.00		
Subtotal		\$ 6,179.00		
8.25% Sales Tax		\$ 509.77		
Installation Labor		\$ 1,800.00		
Admin. /Survey/Cont. (10%)		\$ 848.88		
Total		\$ 9,337.65		



**#12 Radio Hub Bridge Point Parkway**

<u>Task &amp; Items</u>	<u>Due Dates</u>	<u>Costs</u>	<u>Quarter</u>	<u>Start/End Date</u>
	<b>1/04</b>		<b>1st</b>	<b>12/03-1/04</b>
Local radio hub		\$ 3,016.00		
110 vac electric install		350.00		
Phone Line Install		250.00		
Local radio stick antenna		260.00		
Antenna cable with end connectors 60 ft. cable		348.00		
Stainless steel enclosure SB24SS		940.00		
Subtotal		\$ 5,164.00		
8.25 % Sales Tax		\$ 426.03		
Installation Labor		\$ 2,250.00		
Admin. /Survey/Cont. (10%)		\$ 784.00		
Total		\$ 8,624.03		

**Saratoga Drive - Bay Meadows Area:** The controllers for this median of 1.1 miles currently has the CALSENSE controllers, master valves and flow meters. They operate as stand alone controllers and use historical ET for there adjustments. The controllers are ET-1 and we need to upgrade them to ET 2000 with the appropriate communications for local radio. The problem is that there is no communication and checking clock daily only discovers problems with the system. We want to upgrade this system, which is for medians and both sides of a major parkway so we can more efficiently control the irrigation, and get the daily alerts for any problems that arise. The panels for the five units will be removed and sent to the factory for upgrades. Dome antennas will be installed in the stainless steel enclosures that exist. The area will require a hub radio for communications with these five controllers and the central computer.

<u>Task &amp; Items</u>	<u>Due Dates</u>	<u>Costs</u>	<u>Quarter</u>	<u>Start/End Date</u>
<b>#13 Bay Meadows</b>	<b>1/04</b>		<b>1st</b>	<b>12/03-1/04</b>
<b>Saratoga Drive &amp; Delaware street</b>				
Upgrade existing CALSENSE controller ET-1		\$ 1,196.00		
To model ET 2000				
CALSENSE local radio communication		1,517.00		
CALSENSE dome antenna local radio		166.00		
And remote				
CALSENSE integrated radio remote		452.00		
Receiver board				
Subtotal		\$ 3,331.00		
8.25 % Sales Tax		\$ 274.81		
Installation Labor		\$ 1,800.00		
Admin. /Survey/Cont. (10%)		\$ 540.58		
Total		\$ 5,946.39		

Task & Items	Due Dates	Costs	Quarter	Start/End Date
<b># 14 Baymeadows</b>	<b>1/04</b>		<b>1<sup>st</sup></b>	<b>12/03/1/04</b>
<b>Saratoga Drive and Expo Center Road</b>				
Upgrade existing CALSENSE Controller ET-1 To model ET 2000		\$ 1,196.00		
CALSENSE local radio communication		1,517.00		
CALSENSE dome antenna local radio And remote		166.00		
CALSENSE integrated radio remote Receiver board		452.00		
Subtotal		\$ 3,331.00		
8.25 % Sales Tax		\$ 274.81		
Installation Labor		\$ 1,800.00		
Admin. /Survey/Cont. (10%)		\$ 540.58		
<u>Total</u>		\$ 5,946.39		

Task & Items	Due Dates	Costs	Quarter	Start/End Date
<b>#15 Baymeadows</b>	<b>1/04</b>		<b>1<sup>st</sup></b>	<b>12/03/1/04</b>
<b>Saratoga Drive and Franklin Road</b>				
Upgrade existing CALSENSE ET-1 To model ET 2000		\$ 1,196.00		
CALSENSE Local radio communication		1,517.00		
CALSENSE dome antenna local radio And remote		166.00		
CALSENSE integrated radio remote Receiver board		452.00		
Subtotal		\$ 3,331.00		
8.25 % Sales Tax		\$ 274.81		
Installation Labor		\$ 1,800.00		
Admin. /Survey/Cont. (10%)		\$ 540.58		
<u>Total</u>		\$ 5,946.39		

<u>Task &amp; Items</u>	<u>Due Dates</u>	<u>Costs</u>	<u>Quarter</u>	<u>Start/End Date</u>
<b>#16 Baymeadows</b>	<b>1/04</b>		<b>1<sup>ST</sup></b>	<b>12/03/1/04</b>
<b>Saratoga Drive and Park Place</b>				
Upgrade existing CALSENSE controller ET-1 To model ET 2000		\$ 1,196.00		
CALSENSE local radio communication		1,517.00		
CALSENSE dome antenna local radio And remote		166.00		
CALSENSE integrated radio remote Receiver board		452.00		
Subtotal		\$ 3,331.00		
8.25 % Sales Tax		\$ 274.81		
Installation Labor		\$ 1,800.00		
Admin. /Survey/Cont. (10%)		\$ 540.58		
Total		\$ 5,946.39		

<u>Task &amp; Items</u>	<u>Due Dates</u>	<u>Costs</u>	<u>Quarter</u>	<u>Start/End Date</u>
<b>#17 Baymeadows</b>	<b>1/04</b>		<b>1<sup>ST</sup></b>	<b>12/03-1/04</b>
<b>Saratoga and Hillsdale Blvd.</b>				
Upgrade existing CALSENSE controller ET-1 To model ET 2000		\$ 1,196.00		
CALSENSE local radio communication		1,517.00		
CALSENSE dome antenna local radio And remote		166.00		
CALSENSE integrated radio remote Receiver board		452.00		
Subtotal		\$ 3,331.00		
8.25 % Sales Tax		\$ 274.81		
Installation Labor		\$ 1,800.00		
Admin. /Survey/Cont. (10%)		\$ 540.58		
Total		\$ 5,946.39		

<u>Task &amp; Items</u>	<u>Due Dates</u>	<u>Costs</u>	<u>Quarter</u>	<u>Start/End Date</u>
<b><u># 18 Radio Hub Installation</u></b>	<b>1/04</b>		<b>1<sup>st</sup></b>	<b>12/03/1/04</b>
<b><u>Saratoga Drive</u></b>				
Local radio hub		\$ 3,016.00		
110 vac electric install		350.00		
Phone Line Install		250.00		
Local radio stick antenna		260.00		
Antenna cable with end connectors 60 ft. cable		348.00		
Stainless steel enclosure SB24SS		940.00		
Subtotal		\$ 5,164.00		
8.25 % Sales Tax		\$ 426.03		
Installation Labor		\$ 2,250.00		
<u>Admin. /Survey/Cont. (10%)</u>		<u>\$ 784.00</u>		
Total		\$ 8,624.03		
<b><u>Grand Total</u></b>		<b><u>\$155,252.29</u></b>		

Each of the above tasks could be implemented independently of the others. This is how the city is currently implementing the project in increments, using the savings from our water budget resulting from the improvements made to date.

### **A-7 Monitoring and Evaluation**

Monitoring and assessment, list of project-specific performance measures, how data will be handled and made available, list of expected products/outcomes.

City staff will provide complete overview and inspection of work performed by a qualified vendor. City engineers will review all designs and procedures to insure proper installation.

The project-specific performance measures will be timely installation of hardware necessary for Each task listed in the budget.

The actual data scanned and compiled by the master computer will be processed daily and Available 24 hours a day. This unique system monitors and records all facets of the system's Operations and activities.

The expected outcome will be reliable data which can be used to determine total and Incremental water loss, system reliability, trouble shooting and adaptability to modify the system For specific water demands. In this case going for a 40% savings by watering at 60% of daily ET Readings.

Preliminary plans and specifications, certification that project is feasible

Technical data sheets are available from the manufacturer and some have been attached to this Report for review. The list of agencies utilizing this system is quite extensive and these agencies have had this reliable system in operation for a number of years.

We have already successfully installed this system in eight of our parks with excellent results.

The knowledge and experience we have gained from completing these projects will be applied to this project.

### **A-8 Qualifications of the Applicants and Cooperators**

1. Resume of project manager (attached)
2. Role of external cooperators (attached)

### **A-9 Innovation**

The CALSENSE Company equipment to be used in this project represents the very latest in computer technology. We visited with staff in other Bay Area areas to investigate different system providers before deciding on CALSENSE. With future water shortages and price increases very likely, computerized irrigation systems will become increasingly cost effective, and will no doubt come in to general use throughout the state and in all areas where water conservation is a concern. Articles detailing our role and CALSENSE's role in the project are attached.

### **A-10 Agency Authority**

1. **Sheila Canzian: Director of Parks & Recreation for the City of San Mateo** is authorized to submit an application and to enter into a funding contract with the State of California.
2. San Mateo is an incorporated city and a subdivision of California State Government.
3. The City of San Mateo is not required to hold an election before entering into a funding contract with The state.
4. The funding agreement with the State will not be subject to approval by any other governmental agencies.
5. There is no pending litigation.

### **A-11 Operation and Maintenance**

Not applicable

### **B-1 to 4**

Not applicable

### **C-1 to 4**

Not applicable

### **D-1 Need for the Project and Community Involvement**

The City is striving to comply with AB325, the Conservation in Landscaping Act of 1990 and to follow the Department of Water Resources Model Water Efficient Landscape Ordinance, which went into effect January 1, 1993. By conserving water by use of modern equipment we will better prepared to control watering during periods of drought. The system will reduce contamination by fertilizers, herbicides, and other harmful chemicals, of ground water and run off to the San Francisco Bay and associated wetlands. This is collectively called Best Management Practices (BMP). The need is particularly acute for the median strips, particularly J. Hart Clinton Drive, the main artery between The San Mateo Hayward Bridge, Foster City and Highway 101. Vehicles traveling this road often exceed 55 miles per hour. Wet roads can lead to accidents and result in increased wear to asphalt roads. Since a call from a passing motorist is often the first we know of a broken sprinkler head, it can sometimes be hours before the situation is remedied. With CALSENSE any break in the system will be detected and shut down immediately regardless of the hour.

### **D-2 Outreach, Community Involvement, Support, Opposition**

Public outreach regarding this system occurs at city council meetings and the park commission meetings. The public expects city staff to provide public service at the best cost and best management practices. The proof of public support will be noted in the lack of calls from citizens regarding water over spray at medians.

Training and employment will impact city staff and outside consultants and contractors. Economic benefits will again be the savings of water and ancillary activities related to the new system. The savings to the city will allow the city council to improve public service in other areas of need such as traffic safety, streets and highways, police, fire and other critical needs. There is no opposition to the project.

### **E-1 Water Use Efficiency Improvements**

This project will achieve water use efficiency by replacing old controllers with CALSENSE controllers and installing flow meters at each controller along with a master valve, which stays closed until called upon by the central system. To measure out square footage each station covers, the controller calculates into precipitation rates by flow rate over a certain area so that only the water that is evaporated in a given day is put back as irrigation. Budgets for the area can be inputted for each controller and monitored as to performance. The system can be graphed as to budget, historical ET and Actual ET or water applied.

Several graphs are included with our application illustrating the savings we have been able to accomplish to date working with a local contractor and CALSENSE Company. To date installations have been made at Bayside Joinville Park Westside, Los Prados Park, Beresford Park, Laurie Meadows Park, Parkside Aquatic Park and Harborview Park. These parks are all using phone lines as opposed to the areas we want to expand into with this project, which will require local radio hub installs and radio equipment components at the satellite controllers.

### **E-2 Other Project Benefits**

In addition to the direct benefits of reduced water use for irrigation and associated costs to the City of San Mateo there will be other ecological and economic benefits that result from this project. The City purchases water from the California Water Company, which in turn purchases it from the San Francisco Water District. Water conservation savings by the City of San Mateo will allow these agencies to better serve their other consumers. Just as we were introduced to the benefits of a modern, computerized system by other Bay Area agencies, we will share our experience with our neighbors. As more and more agencies modernize their irrigation systems there is the potential for significant savings in our region. Savings in the Bay Area are particularly important since it is the last stop for California's water before it reaches the Pacific Ocean. Upstream users can argue with some validity that water they waste benefits downstream users. Bay Area users do not have the luxury of that argument.

San Mateo is located in the Bay Region of the CALFED solution area. Our Irrigation Reduction project addresses three of CALFED's four specific objectives, one directly, and two indirectly. By substantially reducing the amount of water used for irrigating city parks and median strips, there is a direct benefit to increasing water supply. By decreasing excessive run off of harmful chemical substances to the San Francisco Bay and adjacent waterways, the project indirectly contributes to improved water and ecological system quality.

### **F-1 Net Water Savings**

This project proposes to save 19 acre-feet of water per year by reducing water used for landscape irrigation to the minimum amount consistent with Best Management Practices. Savings will be achieved primarily by reducing surface to San Francisco Bay and adjacent waterways.

### **F-2 Project Budget and Budget Justification**

Each task and associated items are specified in item **A-6**. The figures are derived from the manufacturer, city and landscape architect. The City of San Mateo has included a 10% costs for Project administration, field surveys and contingencies.

We have been most conservative in our costs and offer a significant contribution towards the Success of this project.

The figures represented in the budget are a direct estimate from the vendor and architect. Upon award of funds to proceed with this project, the city will most likely initiate a formal bid Process. It is anticipated that costs could be less via the bid process.

a.	Land Purchase/Easement	NA
b.	Planning/Design/Engineering	NA
c.	Materials/Installation	\$41,950
d.	Structures	NA
e.	Equipment Purchases/Rentals	\$91,665
f.	Environmental Mitigation/Enhancement	NA
g.	Construction/Administration/Overhead	\$14,075
h.	Project/Legal/License Fees	NA
i.	Contingency (up to 15%, amount must be fully justified by applicant)	Incl.
j.	Other (8.25% Sales Tax	\$ 7,562
Total		\$155,252.29

## **Benefit summary and breakdown – list expected project outcomes**

Outcomes will be the successful installation of all items listed in the budget and described at each section. J Hart Clinton Drive is removal of old outdated Rainmaster irrigation clocks and installing CALSENSE units for A through F. Install one radio hub at Anchor Road. Install new CALSENSE unit to replace Irritrol controller at Bayside Joineville Park Back Side. Install new CALSENSE system for Laurel wood Park in the San Mateo foothills removing an Irritrol clock. Install new system for Bridge Point Parkway replacing Irritrol clocks and one new radio hub. AT Bay meadows on Saratoga Avenue the existing CALSENSE ET1 Controllers will be traded in to CALSENSE and the newest controllers the ET 2000 will replace them. They will have radio communications installed within and we will install antennas on the existing stainless steel enclosures. These systems out there already have the flow meters and master valves. We want to get connected so we can get daily reports at our central computer. This also allows us to use our ET gage, which is always less than the historical numbers that are stored in the controller database. We will install a radio hub at this site to facilitate communications.

The outcomes will be a completed system for the (15) controllers and (3) Hubs with:

- Automatic daily re-programming of all field satellites based on site weather conditions
- Automatic shut-down of all field satellites due to rainfall or excessive wind
- Automatic shut-down of systems with unscheduled, unwanted or excessive flow
- Irrigation programming & monitoring of all field satellites from the central computer
- Tracking and reporting of water consumption and irrigation component failures
- Access to the central computer from anywhere via computer and phone modem.

The outcome and benefits will be a savings of approximately 40% in water use and approximately 30% to 50% savings in manpower, equipment and maintenance costs. Another significant benefit is the systems ability to monitor and record all facets of the Irrigation network. The actual data scanned and compiled by the master computer is Processed daily and available 24 hours a day for review and adjustment.

The expected outcome will be reliable data which can be used to determine total and Incremental water loss, system reliability, trouble shooting and adaptability to modify the system For specific water demands.

### **Major analysis assumptions and methodologies:**

- Water Control – Along with the ability to provide efficient watering schedules, central systems allow the user to shut off all irrigation immediately in case of rain or other emergencies that require disconnecting irrigation.
- Reduced Labor Costs – The addition of eleven sites to our central location (HUB) eliminates the need to make schedule adjustments at each controller. Irrigation schedule changes will take minutes instead of hours and system shutdowns can take seconds.
- Gas Savings – will be realized and vehicle wear and tear may be reduced when the user can make changes from a single location instead of having to drive to or around the project site to make irrigation schedule changes both at night and during the day.
- Fertilizer and Chemical – use can be reduced through good irrigation management. Leaching will be reduced which reduces fertilizer applications. In turn, good plant health will reduce pest infestations and disease.



- Street and Road repairs – Irrigation water will degrade asphalt faster than any other source. Runoff will be eliminated and will help prolong asphalt life and reduce repairs and repaving.
- We can set the CALSENSE system to use 60% of the 7 day ET figure and apply the water twice a week in cycles to promote deep watering and rooting.
- We know when and where there are broken sprinklers from the alerts and can send the repair tech to the site for repairs. If the tech is backed up we can program no water days for an individual station for as long as needed before the tech can fix the problem.
- The CALSENSE central computer communicates with each field controller at 8 pm to share the ET number the central got from the park with the ET gage. The satellite controllers then reprogram their nights watering schedule to reflect that days weather conditions. At 7a.m. each day the central calls all the controllers to see how the irrigation went and if there were any problems. We come in check it out and dispatch for repairs or to make adjustments to any program.

a. Express benefits and costs in 2002 dollars:

<u>Item</u>	<u>Cost Benefit/Year</u>
Water Control	\$ 16,150.00
Reduced Labor Costs	3,120.00
Gas & Vehicle Savings	208.00
Fertilizer and Chemical	520.00
<u>Street and Road Repairs</u>	<u>10,400.00</u>
Total	\$ 30,398.00

c. Convert all costs & benefits to present value equivalents

The costs would increase by approximately 4%/year thus a savings of approximately \$31,614 in 2003.

At a cost of approximately \$850 per acre foot, the reduction of water use by up to 19 acre feet Will save up to 16,150 per year. In addition to the water savings the project will also provide the following economic benefits:

<u>Item</u>	<u>Cost Benefit/Year</u>
Water Control	\$ 16,100
Reduced Labor Costs	3,120
Gas & Vehicle Savings	208
Fertilizer and Chemical	520
<u>Street and Road Repairs</u>	<u>10,400</u>
Total	\$ 30,398

These figures graphically demonstrate the economic cost of irrigating with a high maintenance, inefficient system.

The following table further demonstrates the economic efficiency of the project:

Table of present value, quantified costs and benefits for applicant and each beneficiary

<u>Item</u>	<u>(Approximate Annual Calculations)</u>			<u>Beneficiary</u>
	<u>Value</u>	<u>Benefits</u>		
Water	\$850/AC.FT. X 19 AC.FT. =\$16K			City of San Mateo
Water	\$16K.	Water transfer	Cal-Water	
Labor Costs	\$3,120	\$3,120		City of San Mateo
Gas & Vehicle Savings	\$ 208	\$ 208		City of San Mateo
Fertilizer and Chemical	\$ 520	\$ 520		City of San Mateo
*Street and Road Repairs	\$10,400	\$10,400		City of San Mateo

With an approximate annual savings of \$30,000 (excludes 4% annual increase), the city will Greatly benefit from the proposed new system and the return on the grant investment will be Realized monetarily in approximately five (5) years. This does not include the water Savings of approximately nineteen (19) acre-feet per year.

\*The public works department has completed AC patching on one side of J. Hart Clinton Drive at an approximate cost of \$20,000.00. The other side still needs patching. The sprinkler system running unchecked for long periods of time over the years has significantly added to the degradation of the paving. The new CALSENSE ET based controller will terminate irrigation overflows, alert us to broken sprinkler heads or other system malfunctions. Reducing water on roads with traffic cruising at over 50 mph will not only add to the safety of the area but also reduce pavement degradation.

**Third parties and vendors that will benefit:**

**California Water Service** will have more water to supply other users on the Bay area Peninsula.

**Loral Landscape Inc.** which performs landscape median contract maintenance for the City of San Mateo will be notified by either phone or fax as to any alerts for repairs needed to irrigation system. This will allow them to spend more time on other aspects of their job. This is a time saver for them and a valid benefit.

**California Sensor Corporation** will benefit along with their employees for the Calsense equipment purchases we make.

**The contracted installer** will benefit by receiving a Public Works Contract to perform the work and their employee's.

**Citizens of the City of San Mateo** will benefit with 19 acre-feet of additional water during periods of water rationing.

**The people that use J. Hart Clinton Drive** will have a safer roadway to use and not have to go from dry roads to wet roads from stuck on irrigation valves. Besides the heavy commute traffic currently, the road use will increase with the development of the Shorelines Park and open space.

**Pedestrians that cross J. Hart Clinton Drive** at crosswalks will be safer from cars, which often travel over 50 miles per hour, being able to stop on dry pavement. The problem would be a car traveling too fast and coming up to a traffic light where the sprinklers have wet the road causing a panic slide and possible accidents to occur.